

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace, without prejudice, all prior versions and listings of claims in the application.

LISTING OF CLAIMS:

1.-22. (Canceled)

23. (Currently Amended) A device for producing a plasma through microstructure electrode discharges, a use of the plasma including at least one of treating surfaces, chemically reacting gases, and producing light, the device comprising:

at least one guide structure, the at least one guide structure including at least one hole having a diameter of ~~50~~¹⁰ μm to 1000 μm , wherein a plasma region includes at least one of the hole and an area adjacent to the hole; and

a microwave generator, the microwave generator launching electromagnetic microwaves into the at least one guide structure to produce the plasma, the plasma being produced in the plasma region.

24. (Previously Presented) The device of claim 23, further comprising at least one launching structure, wherein the launching structure links the microwave generator with the at least one guide structure.

25. (Previously Presented) A device for producing a plasma through microstructure electrode discharges, a use of the plasma including at least one of treating surfaces, chemically reacting gases, and producing light, the device comprising:

at least one guide structure, the at least one guide structure including at least one hole, wherein a plasma region includes at least one of the hole and an area adjacent to the hole;

a microwave generator, the microwave generator launching electromagnetic microwaves into the at least one guide structure to produce the plasma, the plasma being produced in the plasma region, wherein the at least one guide structure is a metallic waveguide filled with a dielectric

material, the dielectric including at least one of silicon dioxide, ceramic, and Kapton; and further comprising:

an arrangement of at least two spaced metal plates, the at least two spaced metal plates forming an interstitial space filled with a dielectric material.

26. (Previously Presented) A device for producing a plasma through microstructure electrode discharges, a use of the plasma including at least one of treating surfaces, chemically reacting gases, and producing light, the device comprising:

at least one guide structure, the at least one guide structure including at least one hole, wherein a plasma region includes at least one of the hole and an area adjacent to the hole; and

a microwave generator, the microwave generator launching electromagnetic microwaves into the at least one guide structure to produce the plasma, the plasma being produced in the plasma region, wherein the at least one guide structure is an arrangement of at least two spaced metal plates, the at least two spaced metal plates forming an interstitial space filled with a dielectric material.

27. (Previously Presented) A device for producing a plasma through microstructure electrode discharges, a use of the plasma including at least one of treating surfaces, chemically reacting gases, and producing light, the device comprising:

at least one guide structure, the at least one guide structure including at least one hole, wherein a plasma region includes at least one of the hole and an area adjacent to the hole; and

a microwave generator, the microwave generator launching electromagnetic microwaves into the at least one guide structure to produce the plasma, the plasma being produced in the plasma region, wherein the at least one guide structure is an arrangement of at least two metallic strip lines, the at least two metallic strip lines running on a dielectric plate.

28. (Previously Presented) A device for producing a plasma through microstructure electrode discharges, a use of the plasma including at least one of treating surfaces, chemically reacting gases, and producing light, the device comprising:

at least one guide structure, the at least one guide structure including at least one hole, wherein a plasma region includes at least one of the hole and an area adjacent to the hole; and

a microwave generator, the microwave generator launching electromagnetic microwaves into the at least one guide structure to produce the plasma, the plasma being produced in the plasma region, wherein the at least one guide structure is at least one of planar, curved, cylindrical and coaxial, the at least one guide structure including an internal, central conductor.

29.- 30. (Canceled).

31. (Previously Presented) The device of claim 23, wherein an inner wall of the at least one hole is provided with at least one of a dielectric coating and a ceramic protective layer.

32. (Canceled).

33. (Previously Presented) The device of claim 23, further comprising a multiplicity of holes, wherein the multiplicity of holes are regularly spaced.

34. (Previously Presented) The device of claim 25, wherein the metallic waveguide has a thickness.

35. (Previously Presented) The device of claim 26, wherein the metal plates have a spacing of 10 mm to 1000 mm.

36. (Previously Presented) The device of claim 25, wherein an H_{10} mode of the microwaves is launched into the at least one guide structure.

37. (Currently Amended) A method for producing a spatially narrowly limited gas plasma comprising:

providing a microwave generator, the microwave generator coupled to a launch structure, the launch structure coupled to at least one guide structure, the at least one guide structure including at least one hole having a diameter of ~~50~~50 μm to 1000 μm , wherein a plasma region includes at least one of the hole and an area adjacent to the hole;

launching microwaves through the launch structure into the at least one guide structure; and

supplying a gas, wherein the microwaves and the supplied gas produce a plasma in the at least one plasma region.

38. (Previously Presented) The method of claim 37, wherein the supplied gas is directed through the at least one hole provided in the at least one guide structure.

39. (Previously Presented) The method of claim 37, wherein the supplied gas is directed past the at least one guide structure and the at least one guide structure is acted upon by the supplied gas, a plasma being produced in a plasma volume at a surface of the at least one guide structure at least on a region by region basis.

40. (Previously Presented) The method of claim 37, wherein the plasma is produced at a pressure of 0.01 mbar to 1 bar.

41. (Previously Presented) The method of claim 37, wherein a microwave power of approximately 1 mW to 1 watt is supplied to the at least one plasma region.

42. (Previously Presented) The method of claim 37, wherein the supplied gas is at least one of an inert gas, argon, helium, xenon, air, oxygen, hydrogen, acetylene, methane, a gaseous precursor material, and a vaporous precursor material.

43. (Previously Presented) The method of claim 37, wherein the gas is supplied with a gas flow of up to 5000 sccm.
44. (Previously Presented) The method of claim 37, wherein a frequency of the launched microwaves is between 300 MHz to 300 GHz.
45. (Previously Presented) The method of claim 37, wherein the spatially narrowly limited plasma is located in the immediate vicinity of the surface of a substrate, and further comprising using the plasma for at least one of:
- processing and activating at least one surface of the substrate for chemical reactions including exhaust gas cleaning;
 - producing light; and
 - depositing layers on the substrate.